Wedner lives and works at full throttle

You have to feel sorry for the other kids at the 1955 science fair in Pittsburgh. After all of their tinkering, hammering and pasting, they all felt worthy of the big prize. And then 14-year-old Jim Wedner showed up with a homemade, perfectly functional heart-lung machine. The other contestants surely felt like sneaking their rat mazes and moon dioramas out the door.

Most of those kids probably have recovered from the defeat. But H. James Wedner, M.D., professor of medicine, never lost the curiosity and drive that once made him a science fair juggernaut. He still overdoes things, still pushes with a determination that belies his upbeat, good-humored personality. And he still gets results.

Today his energy is focused on beating allergies and asthma -- opponents that seem to gain strength every year. For unknown reasons, the disorders are becoming more common and more severe, from Papua New Guinea to Scandinavia. Asthma is hitting the United States particularly hard and is now the No. 1 cause of hospital visits for American children. Like other allergists, Wedner doesn't know why allergies and asthma are gaining ground. But he does have a plan: He attacks the disorders from every angle and reduces suffering patient by patient.

Every allergic reaction starts with an allergen, perhaps a grain of oak pollen or a flake of cat dander. Wedner, chief of clinical allergy in the Division of Allergy and Immunology, studies the structures of many types of allergens and tries to understand how they interact with the immune system. He hopes the research will lead the way to more effective forms of immunotherapy.

He also goes to great lengths to observe allergens in their natural habitat -- the air that people breathe. For example, to find out how much dander a typical cat owner inhales in a day, he strapped a suction pump and an air filter onto his 24-year-old son, Jason. The filter, which rested just below Jason's chin, presumably collected the same kind of air that went into Jason's lungs that day. Wedner found that cat owners are bombarded with allergens that are just the right size to lodge in the lungs. He also strapped the device onto a four-year-old child with allergies who spent considerable time in a damp basement. The filter gave Wedner a new insight into the child's disease. "It was a little scary to see how many fungal spores that child was breathing," he said.

Invisible effects of the 1993 flood

Wedner's search for allergens has led to many surprising and important discoveries. Working with Anupma Dixit, Ph.D., research instructor of medicine, he found incredible amounts of mold in local houses that had been inundated by the Midwest flood of 1993. Many types of mold are powerful allergens, and their growth in flooded homes posed a serious -- and underappreciated -- health risk.

In another study, Wedner and Dixit found that an allergy-causing mold once thought to be limited to rural areas is actually quite common throughout St. Louis. Their research method? One day, they simply left an open culture dish in a parking lot near Wedner's office. In just 15 minutes, the dish collected enough spores to prove that city residents are exposed to the allergen.

Wedner keeps a close watch on allergens, but they are not his top priority. "If you're interested in allergens, you have to be interested in the people who breathe them," he said. Why is a particular patient sick, and what can be done about it? He takes these questions seriously, much to the appreciation of his patients.

"He has the busiest practice of any of the physicians in our division," said David Chaplin, M.D., professor of medicine and of genetics and head of the allergy and immunology division. "His patients are extremely devoted to him."

Sometimes, relief for a patient is as simple as getting rid of the cat or spending less time in the basement. But other cases are more perplexing. For instance, researchers have long wondered why inner-city children are so vulnerable to asthma. The children who live there don't breathe much cat dander or dust -- major asthma triggers in suburbia -- yet they're twice as likely as other children to develop the disease.

As one of the principal investigators in the National Cooperative Inner-City Asthma Study (NCICAS) funded by the National Institutes of Health, Wedner has worked extensively in inner-city St. Louis neighborhoods trying to bring relief to hundreds of local children. Along with colleagues at the School of Medicine and Saint Louis University, Wedner tried to understand everything that might contribute to a child's asthma. In one part of the study, researchers used hand-held vacuums to collect potential allergens in children's homes. They also interviewed the children and their parents to learn about their daily routines, potential sources of stress, current medical treatment and their knowledge of asthma.

"We had the naive idea that there was something unique about the inner city, and if we could find out what that was, we could cure asthma there," Wedner said. "We found out that everything is important." Some children were breathing too much cigarette smoke, some were getting inadequate medical care and many -- particularly in the St. Louis area -- were sensitive to the allergens of ever-present cockroaches.

Researchers lost hope of finding a single, treatable cause of inner-city asthma, but they didn't give up on the children. Wedner and others discovered that many kids rapidly improved if they had an asthma counselor who could help them understand their illness and address their individual needs. If more kids had access to asthma counselors, and if residents could rid their neighborhoods of cockroaches, asthma would cause much less suffering in the inner city, he said.

"We identified a problem, found some things that correlate to the problem and came up with a strategy that seems to work," Wedner said. "That program has been a huge success."

Wedner's success in the medical field started early. When he was 16, he worked with a chest surgeon at Children's Hospital in Pittsburgh to study the vital signs of animals hooked up to heart-lung machines. Processing the data involved feeding punch cards into a computer that took up three large rooms.

Wedner studied zoology at Cornell University as an undergraduate and received a medical degree there in 1967. He then joined Barnes Hospital as an intern but was drafted into the Coast Guard one year later. After two years of service -- much of it spent on an Arctic icebreaker -- he returned to Barnes as a senior assistant resident. In 1973, he became an instructor of medicine at the medical school, and he has been on the faculty ever since.

He became interested in allergies and immunology shortly after returning from the Coast Guard. At the time, he had no idea that the small field soon would explode with exciting new discoveries shedding light on the workings of the immune system. He merely wanted to work with Charles Parker, M.D., then the medical school's director of the Division of Allergy. When Wedner started teaching, he could give students a solid, thorough overview of immunology in a two-hour lecture. Now, he says, it takes several lectures barely to scratch the surface.

Immunology's mysteries

Despite recent progress, the field of immunology still holds some huge, tantalizing mysteries. Why do some people have allergies while others don't? Why is asthma more common in children than adults? What makes an allergen an allergen? And why is asthma more common than it used to be? These questions help keep Wedner energized --not that energy was ever in short supply.

"It's amazing how much he can get accomplished in one day," said Richard Evans III, M.D., head of the Division of Allergy at Children's Memorial Hospital in Chicago and co-investigator in the NCICAS. "He's an excellent speaker and teacher, and he has a masterful ability to get people to work together."

As one might expect, Wedner also takes a full-throttle approach to his hobbies. He likes to go birding with his wife, Marti, a photographer who has taken enough heron pictures to cover the walls of Wedner's office. Wedner often stalks the birds with a video camera, giving him many joyful hours editing epic home movies on his computer.

Waterfowl action flicks aside, Wedner is most proud of his accomplishments as a physician. He currently sees patients at the medical school's Asthma Center (formerly owned by Barnes-Jewish West County Hospital), and he is committed to improving the lives of his clients. Patients at the Asthma Center now fill out quality-of-life questionnaires before and after their treatment. "My goal is not only to make them better clinically but also to make them feel better to their satisfaction," Wedner said.

And once Wedner sets his sights on a goal, there's a good chance he'll reach it. Just ask the other kids from the 1955 Pittsburgh science fair. -- *Chris Woolston*

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